

REMARKS

Claims 1 to 16 are all the claims pending in the application, prior to the present Amendment.

Claim 1 has been rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent 3,632,557 to Brode et al.

In addition, claims 2, 3 5-7, 10, 11, 13, 14 and 16 have been rejected under 35 U.S.C. § 103(a) as obvious over Brode et al in view of JP 05-039428 to Kiyoko et al.

Applicants submit that Brode et al and Kiyoko et al do not disclose or render obvious the subject matter of the amended claims of the present application and, accordingly, request withdrawal of this rejection.

The present invention as set forth in claim 1 as amended is directed to a curable composition comprising an organic polymer (A) which has on average 1.1 to 50 groups per one molecule thereof each represented by general formula (1), representing a urethane bond, and has one or more silicon-containing functional groups capable of cross-linking by forming siloxane bonds and a tin carboxylate and/or a carboxylic acid (B). The carbon atom adjacent to the carbonyl group of the tin carboxylate and/or of the carboxylic acid (B) is a quaternary carbon atom.

Thus, applicants have amended claim 1 to incorporate the recitations of claim 3 and to recite a tin carboxylate in component (B) instead of a metal carboxylate. Support for tin carboxylate can be found, for example, at page 25, lines 17-18, and page 25, first two lines. The tin carboxylate and/or the carboxylic acid serve as a catalyst and are a non-organotin catalyst.

Thus, the present invention provides a curable composition comprising (1) an organic polymer (A) which has on average 1.1 to 50 groups of urethane bonding per one molecule thereof each, and (2) a catalyst that does not contain any hydrocarbon group-tin bonds, and especially is a tin carboxylate and/or a carboxylic acid that has a quaternary carbon atom adjacent to the carbonyl group of the tin carboxylate and/or of the carboxylic acid.

The above two features contribute to providing a curable composition with excellent heat stability and excellent curability, without employing a catalyst that contains hydrocarbon group-tin bonds.

As stated at page 29, lines 15-18 of the present specification, a metal carboxylate in which the carbon atom adjacent to the carbonyl group is a quaternary carbon atom is advantageous in providing a curable composition with better adhesion.

Further, as stated at page 34, last line, to page 35, line 3 of the specification, a carboxylic acid in which the carbon atom adjacent to the carbonyl groups is a quaternary carbon atom is advantageous in providing a curable composition with a rapid curing rate.

The present invention provides a composition that exhibits excellent heat resistant and excellent curability of the curable composition. The excellent heat resistant and excellent curability of the curable composition of the present invention is demonstrated in the working Examples of the present specification.

In Examples 1-11, tin (II) neodeconate (Neostann U-50) and a neodecanoic acid (Versatic 10) were used as component (B).

On the other hand, in Comparative Examples 1-3, dibutyltin dilaurylate (Stann-BL), a catalyst that contains hydrocarbon group-tin bonds, was used instead of component (B) of the

present invention. See page 0085 of the present specification for a description of U-50, Versatic 10 and Stann-BL.

By comparing the properties of the obtained curable compositions, it can be seen that the curable compositions of the present invention showed shorter tack-free times and higher retention rates of M-50 value after heat curing. A shorter tack-free time reflects better curability as disclosed at page 86, lines 9-10, of the present specification. A higher retention rate of M-50 value after heat curing reflects better heat resistance, as disclosed at page 87, lines 1-2, of the present specification. Thus, the curable compositions of the present invention are superior to those of the comparative examples in their curability and heat resistance.

In addition, Examples 8-11 and Comparative Examples 4-7 illustrate a relation between the number of urethane bonds, namely, the group represented by general formula (1) of claim 1, and tack-free time of a curable composition. As illustrated in Table 3, comparative curable compositions containing organic polymers that have on average 1.0 or less groups represented by formula (1) per molecular show longer tack-free times. See Comparative Examples 4-7 of Table 3. This is unfavorable.

The results in Table 3 clearly show that curability was improved if the average number of the group represented by formula (1) exceeded 1.1 on average.

The Brode et al patent discloses a curable composition comprised of an organic polymer and a catalyst which can be a metal salt of a carboxylic acid such as stannous octoate, dibutyltin dilaurate and the like. Brode et al do not disclose or suggest the use of a tin carboxylate and/or a carboxylic acid that has a quaternary carbon atom adjacent to the carbonyl group of the tin carboxylate and/or of the carboxylic acid.

Further, Brode et al do not disclose or suggest the use of an organic polymer (A) which has on average 1.1 to 50 groups of urethane bonding per one molecule thereof.

JP '428 to Kiyoko et al which the Examiner has cited for disclosing various bismuth compounds as catalysts, also does not disclose or suggest the use of a tin carboxylate and/or a carboxylic acid that has a quaternary carbon atom adjacent to the carbonyl group of the tin carboxylate and/or of the carboxylic acid.

Further, neither Brode et al nor JP '428 to Kiyoko et al disclose the advantageous effects that are achieved by the present invention. Thus, neither of these patents show an improvement in curability if the average number of the group represented by formula (1) of claim 1 exceeded 1.1 on average.

In view of the above, applicants submit that Brode et al and JP '428 to Kiyoko et al do not disclose or suggest the subject matter of the present claims and, accordingly, request withdrawal of this rejection.

Claims 4, 12 and 15 have been rejected under 35 U.S.C. § 103(a) as obvious over Brode et al in view of U.S. Patent 6,350,345 to Kotani et al.

Applicants submit that Brode et al and Kotani et al do not disclose or render obvious the subject matter of the present claims, and, accordingly, request withdrawal of this rejection.

Applicants have discussed Brode et al above and rely on that discussion.

Kotani et al are directed to a curable resin composition and disclose a long list of compounds which can be used as an accelerator component (III) in their composition. Among the long list of compounds disclosed as being useful as an accelerator are tin compounds, including stannous versatate, as disclosed at column 14, line 29.

Kotani et al also disclose a urethane bond as a mere example of the group R¹ among many possible bonds. See column 3, lines 54-67 of Kotani et al.

However, Kotani et al do not refer to any specific combination of the claimed components (A) and (B) of the present claims.

Further, Kotani et al do not demonstrate any working example using an organic polymer containing urethane bonds. Still further, Kotani et al do not disclose a relation between curability and the number of urethane bonds.

In view of the above, applicants submit that one of ordinary skill in the art would not have been led to combining the teachings of Kotani et al with those of Brode et al to arrive at the present invention and the effects of the present invention.

Applicants submit that the Examiner's rejection is based on hindsight since there is no disclosure in Kotani et al which would lead to the combination set forth in the present claims with the effects of the present invention.

In view the above, applicants submit that Brode et al and Kotani et al do not disclose or render obvious the subject matter of the present claims and, accordingly, request withdrawal of this rejection.

Claims 8 and 9 have been rejected under 35 U.S.C. § 103(a) as obvious over Brode et al in view of JP '428 to Kiyoko et al, Kotani et al and further in view of WO 03/011978 to Okamoto et al.

The Examiner refers to U.S. Patent 7,115,695 to Okamoto et al as being an English language document that corresponds to WO '978 to Okamoto et al. In the following discussion, applicants will refer to the U.S. patent to Okamoto et al.

Claims 8 and 9 depend from claim 1. Accordingly, applicants submit they are patentable for the same reasons as discussed above in connection with claim 1. Okamoto et al do not supply the deficiencies of Brode et al, JP '428 to Kiyoko et al and Kotani et al.

Brode et al, JP '428 to Kiyoko et al and Kotani et al have been discussed above. Applicants rely on that discussion.

The Examiner cites Okamoto et al for a disclosure of a carboxylic acid as a component (B). Thus, the Examiner states that Okamoto et al disclose that a carboxylic acid wherein a carbon atom adjacent to the carbonyl group is a tertiary carbon or a quaternary carbon is more preferred as a constituent of component (B) of Okamoto et al, as disclosed at column 15, line 61, to column 16, line 8 of Okamoto et al.

Applicants submit that the Examiner has not correctly analyzed the teachings of Okamoto et al.

As stated by the Examiner, Okamoto et al provide an explanation of component (B) of Okamoto et al at column 15, line 61 to column 16, line 8. Component (B) of Okamoto et al, however, is one or more carboxylic acid metal salts. See column 2, lines 55-60, column 14, lines 6 to 60 and claim 1 of Okamoto et al for a description of component (B).

The various carboxylic acids disclosed at column 15, line 61, to column 16, line 8 of Okamoto et al are examples of the carboxylic acid functionality in such acid metal salts. Okamoto et al do not disclose any free carboxylic acid wherein a carbon atom adjacent to the carbonyl group is a quaternary carbon atom. Further, Okamoto et al do not disclose the use of tin carboxylates as a catalyst of their invention, as can be clearly seen from the description of the compounds (2) to (12) at column 14, lines 38-57, where Okamoto et al describe the various

carboxylic acid metal salts that can be used in their invention. See also the description of component (B) of Okamoto et al at column 2, lines 55-60, and claims 1 and 3.

Okamoto et al disclose the use of tin octylate as a comparative catalyst, but this catalyst is not a catalyst wherein a carbon atom adjacent to the carbonyl group is a quaternary carbon atom.

Accordingly, applicants submit that Okamoto et al do not disclose or render obvious the use of carboxylic acids as recited in claims 8 and 9.

In view of the above, applicants submit that claims 8 and 9 are patentable over the cited prior art and, accordingly, request withdrawal of this rejection.

Claims 1-3, 5-7, 10, 11, 13, 14 and 16 have been rejected under 35 U.S.C. § 103(a) as obvious over Okamoto et al.

In addition, claims 4, 8, 9, 12 and 15 have been rejected under 35 U.S.C. § 103(a) as obvious over Okamoto et al in view of Kotani et al.

Applicants submit that these references do not disclose or render obvious the presently claimed subject matter and, accordingly, request withdrawal of this rejection.

As discussed above, Okamoto et al do not disclose or suggest a tin catalyst and/or a carboxylic acid that has a quaternary carbon atom adjacent to the carbonyl group of the tin carboxylate and/or of the carboxylic acid.

Further, Okamoto et al do not disclose or suggest the unexpected effects of excellent heat resistance and excellent curability that is obtained by the curable composition of the present invention.

Further, Kotani et al has been discussed above and applicants rely on that discussion. Thus, Kotani et al do not refer to any specific combination of the claimed components (A) and

(B), do not demonstrate any actual example using an organic polymer containing urethane bonds, and do not disclose a relation between curability and the number of urethane bonds.

Accordingly, Kotani et al do not supply the deficiencies of Okamoto et al.

In view of the above, applicants submit that the present invention is not disclosed or suggested by Okamoto et al and Kotani et al and, accordingly, request withdrawal of this rejection.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.


Respectfully submitted,

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

23373

CUSTOMER NUMBER


Sheldon I. Landsman
Registration No. 25,430

Date: July 15, 2008